The Maryland Fruit Grower

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JUST PLAIN DIRT

Speaking before the Middle Atlantic Fruit Growers' Conference, Dr. J. H. Gourley of Ohio Experiment Station, stated that unfortunately, one end of a fruit tree had to be stuck into the ground, and that was where the fruit growers' troubles began. Since there is so much interest in soil conservation after careless years of farming, and since soil improvement is one aim of every thoughful farmer, possibly a few comments picked up at random will be worth while.

In Illinois State Horticultural Society News Letter, December 1937, Dr. Firman E. Bear quoted one soils authority as saying that "plowing and cultivating land is comparable to performing a surgical operation on a human being—indispensable at times, but to be avoided whenever possible". He had observed the texture of various types of cultivated soil and found that each cultivation tended to break down the soil "crumbs", and the soil became more doughy in its make-up. As high as 25 to 30% more soil particles were found in a cubic foot of cultivated soil as in a virgin soil of the same type. Erosion by wind and water increased as the soil moved farther from its original condition. But we must plow land, at times. One proposal that has been put forth is to plow up less land, and grow greater crops on less area and the greater crop residues will help in maintaining the soil and we will also have more sod land resting which can be used as a rotation when the cultivated soil is put down to sod. Another soils man stated that the Lord had helped man by causing weeds to grow in cultivated soil, thus reducing erosion.

The whole problem comes back to that old stand-by, "organic matter" and there is a lot more to learn about organic matter and its benefits and make-up. It seems that what facts we know about organic mater won't "stay put", due to the many weather and climatic factors that affect it. Ohio experiments extending back for many years have shown that apple trees mulched rather heavily have borne more fruit, and that there is a great difference in moisture content of mulched versus cultivated soils, in favor of mulch.

It is agreed that cultivation does deplete soil organic matter. Dr. Gourley quoted from Jethro Tull's book written in 1753 in which it was stated that "the finer land is made by tillage, the richer it will become, and the more plants it will maintain". Tull's idea was to cultivate soil until the particles were small enough to enter the roots, nourish the plants and the unused parts have their "chief exit through the leaves."

There is, however, some disagreement as to just what organic matter does to a soil. Dr. White of Pennsylvania Experiment Station stated at the Pennsylvania Fruit Growers' Summer Meeting in 1937, that organic matter

was mainly fuel upon which the soil bacteria worked. Dr. Gourley calls organic matter one of agriculture's "eternal verities", and warns us that it is difficult to add materially to the permanent supply of humus by plowing under green manures, and that this material does not pile up in the soil as money in a bank account. His experiments in water absorption showed that 1.76 cubic centimeters of water were absorbed per minute in mulched soil; 1.06 cc. in sod, and 0.56 cc. in cultivated and cover cropped soil.

Now, to summarize, we know that tillage destroys organic matter and helps soil to wash or blow away. We feel that we must plow or cultivate occasionally. We know that we must try to increase, or at least maintain organic matter in the soil. We know that in any crop, water is the thing that aids in dissolving plant food nutrients in the soil; in moving this material into the plant; in carrying on plant transpiration and food manufacture; in moving the food from the leaves to the various parts of the plant, and in cases where fruit is borne, the fruit may contain 95% or more of water. So we have trees or plants with one end in the ground and a lot of water to be gotten into these trees or plants. That must come from the soil in a rather steady supply, which means that the soil must have capacity to hold moisture.

Cover-Cropping

Just how to get the most out of the cover crop is a question. If plowed down in immature state, the cover crop contains the most organic nitrogen, and will decay rapidly. Dr. Gourley suggests that the cover crop be plowed down when it has grown its best tonnage, but is not too mature, as such a condition disturbs the water relations in the soil, and the mature material rots rather slowly. Even when used for mulching purposes, hard-ripe vegetation will remain longest as mulch material, but will contain least nitrogen. He advises that in all of our "getting", we should try to get organic matter in the orchard soil. That probably calls for fertilizing between the tree rows, and using such fertilizer as may be necessary to grow a cover crop.

In orchard practice, it may be necessary to use a cultivation-cover crop system. This applies mainly to peach orchards, although it is used in young apple orchards. However, it is becoming more of a custom to put the young orchard in a legume cover and strip-cultivate the tree rows, widening the strip as the trees demand more room. The legume is mowed, when necessary, and the hay left lying on the ground, or placed around the trees. In bearing peach orchards, disking is suggested in the early season, using a summer cover crop such as soybeans or cowpeas, which are cut into the land, when the pods begin to harden, after which a winter cover crop or rye and vetch is seeded. More benefit is gotten from this winter cover if it is left in the spring until it has made most of its growth, then disk, if possible, or plow under.

Mulch Systems

The sod-mulch system is an excellent one. In this system, the orchard is seeded to a permanent cover, such as grass, clover, alfalfa or other legumes or mixed grasses. The growth is mowed at intervals, and left lying, or else forked under the trees as a mulch. Depending upon soil conditions, this sod may be simply cut up by light disking each spring, or it may be left for two or more years, and then torn up with a disk or weed-hog harrow, after which it generally re-seeds itself.

Then there are other systems involving use of mulch. Some growers are

using any kind of cannery refuse, manure, shredded corn fodder, ground corn cobs, etc., disking this material in the soil or leaving it as a surface mulch. When such dry materials as fodder, straw or cobs are used, it is best to add sufficient nitrogen fertilizer to help in decomposing this material, in addition to furnishing nitrogen for tree growth. The use of straw and hay mulch is gaining more favor each year. In some sections of the West and the East, growers are either buying cheap straw, or even leasing parts of farms to produce their mulch of hay. About 1 or 2 bales of straw are used per tree, as a start, and more straw is added as necessary or as found possible. The cost of this system may be a handicap, if straw is costly. About 7 to 8 dollars a ton is considered the top price in this system. Of course, the ideal way is to grow the mulch right in the orchard, but with large bearing trees, this is almost impossible, but worthy of trial. One drawback may be the fact that the orchard soil is shallow or thin, due to earlier cultivation and erosion. The moral seems to be to build up the organic soil content when the orchard is young.

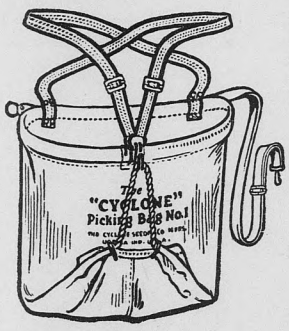
Erosion Control

In these days of soil conservation programs, the grower should consider seriously the possibility of joining such programs and of following some definite system or soil maintenance or improvement. Then there is that more serious menace of soil erosion. Someone has said that the modern farmer can sit on his front porch during a storm, and watch the rest of the county go by.

The first thing to do is to try to prevent the starting of gullies. If they do start, the next thing is to build rock or board dams and brush fills. Then scatter some strawy manure along the gully banks and throw some seed on the manure. Usually, orchard grass, timothy and Korean lespedeza will seed a gully bank in good shape. Where new orchards are to be planted, it is well to consult with soil erosion men and consider the possibilities of terraces.

Soil improvement is a slow and costly job, but if we will figure it out,

Fruit Picker's Bags



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there are lots of ways to start on a small scale. The use of lime and fertilizer on the cover crop; selection of cover crops suited to our individual orchard soils; the development of a soil management program; and the control of erosion are essential steps, if the farm or orchard soils are to be farmed rather than mined.

The idea is to get the "stuff" into the soil. The trees will get it eventually, if there is enough soil moisture to take care of the tree's needs. Beside that, keep in mind that slogan of a famous paint company, "Save the surface and you save all."

THINNING

Unfortunately, fruit trees have the habit of setting too many fruits, and worse, some varieties have the bad habit of bearing only biennial crops, practically resting every other year. Fruit growers have had this problem, all along, but in the older systems of fruit growing, there was little worry about it, as there was an outlet for almost all of the fruit, no matter what size or condition.

An article by Dr. H. B. Tukey printed in June 1937, Rural New Yorker is interesting in reviewing what has been done in thinning as a means of fruit improvement by thinning, and a few ideas that he presents should be of interest.

In 1896, S. A. Beach thinned some apples, and suggested that thinning should be begun as soon as possible after the fruit had set, even before the June drop, and the sooner, the better. That is still true. Some growers thin with pruning shears, feeling that one cut will save a lot of hand thinning later. That, of course, is early thinning. Then there is another form of thinning that is effective, but hardly practical in our program of orchard management. That is the thinning of blossoms. This happens naturally, when frost kills the bloom, and if all bloom is killed, it will usually come back strong, the next year, and we have a tree in biennial bearing condition. In 1846, Robert Manning of Salem, Massachusetts, noticed that his Baldwin trees were biennial bearers, blooming heavily the year after a heavy crop of bloom had been killed by freeze injury. Being curious, he spent two days, in thinning off the excess blossoms of a tree, and found that the thinned tree bore a good crop the following year, while the unthinned trees had no crop. Of course, blossom thinning is not a commercial possibility. At times, growers have thought of spraying a tree in full bloom with some caustic material, to reduce the bloom, but the danger of causing damage, to foliage, thus injuring the next year's buds, and also possibly burning off more bloom than desired, have made this spray idea rather doubtful.

However, out in Washington State, in 1927, Mr. A. C. McCormick tried some blossom thinning with Ortley and Newtown, removing two blossom clusters, and leaving the third cluster. On other trees, he removed three blossom clusters, and left the fourth. Six weeks later, he balanced up all trees by leaving the same number of fruits, and had one fruiting spur to six non-fruiting. He had left only 3% of the original blossoms, yet had enough for a crop. The real results of the thinning showed the next year, when the thinned trees came back with 36% to 56% bloom, and the unthinned trees 0.7% bloom. The results were more surprising when we consider that the final thinning came 6 weeks after bloom, and the total weight of apples removed in the thinning at that time was 59% of the total weight of the crop

at harvest. One drawback to the use of blossom thinning, is that many of the blossoms are going to drop, any way. Anjou pear will mature a full crop if 2 or 3% of the blossoms set. There are records where 8% of the blossoms set, and after the drop, 2.8% were left, with a resulting full crop.

So we leave the theory of blossom-thinning and suggest that thinning be done after the first wave of dropping is past; about 5 to 10 days after petal-fall. There are about four different "drop" periods in the apple (Missouri Bulletin 379). The first two drops are grouped together as the "first drop" and the last two are called the "June drop." These drops occur at about two week intervals. Not all is known about the causes of these drops, but probably the first is that of flowers that are not pollinated or are self-pollinated and are weak. The second drop is of small fruits that may have weak embryos or are poorly nourished, so grow very little. The third and fourth drops are composed of fruits about ½ to 1 inch in diameter, and caused probably, by competition for food or a poor food supply. Individual limbs or branches may differ in amount of June drop.

Peaches may be considered as annual croppers, but J. E. Shoemaker at Ohio Experiment Station found that early thinning had some effect upon next year's crop. He removed 2415 fruits from an Elberta tree carrying 4905 fruits. The final crop was 2221 peaches or 9.3 bushels. He found that thinning about mid-June reduced the crop somewhat that year, but not as much as late thinning, but the early-thinned trees came back with a better crop next year than did the late-thinned or unthinned trees. He found, however, that early-thinned trees required more thinning, as in some cases from 800 to 1200 fruits that were thinned off might have fallen off anyway.

Distance of thinning has always been a question. There is the method of thinning to a certain space between fruits, and lately it has been found that 40 to 50 leaves per fruit were best if the fruit was to size and color well. It has been found that food materials may be carried as far as 10 feet away from the leaves where they were made. This means that light crops, even in clusters may be left, expecting them to attain size, if disease or insects do not work in between the fruits in the clusters. Dr. Tukey states that the new conception of fruit thinning is to look at the tree, decide what amount of fruit it can carry to maturity, then thin accordingly. The only drawback to this is that there is no way to tell the orchard help just how to thin unless there is close supervision. The usual man can thin fruit if told to leave it "two fists apart."

Some work at Illinois Station showed that thinning by tree vigor is a good plan. In some trials the fruit was left until rather good size, then the smaller fruits were removed even late, up to 31 days before picking. The results were good, but not as good as early thinning. Michigan has been suggesting that the fruit bearing wood be considered, thinning very heavily on the smaller-diameter, weaker wood. Ohio observations have shown that the matter of distance is confused, and a 10 inch distance is not always double a 5 inch distance, or that a 4 inch distance may average above six inches. Sometimes some confusion arises because the thinning is not measured from one fruit down to the spur or twig, and out to the next fruit as *linear inches,* but is measured from the location of the fruit in relation to the next fruit. Thus, two fruits may almost touch, yet be several linear inches apart. The New York (Geneva) Station has shown that there are three distinct stages in the growth of the peach, plum or cherry fruits. First, following

bloom and set, there is rapid size increase, followed by almost a standstill, and then before maturity, comes the final swell, which is rapid. Since the fruits are using food resources of the tree, it is a good plan to thin off the excess fruits as soon as possible, and before the pits begin to harden, if it can be done. This would mean thinning of early varieties first. Thinning at any time between set and harvest is of benefit, but the earlier the better.

Beside early thinning yearly, Dr. Tukey suggests sufficient thinning, according to the tree vigor and the load it can carry; also being careful to keep damage to spurs to a minimum; and thinning as thoroughly as possible, breaking up clumps and doubles, if possible.

As stated each year when the thinning subject is discussed, each grower is the judge of what he is thinning for. While one grower may thin only to remove defective fruit, another grower may thin merely to lighten the load and prevent breakage. Another grower may thin early and heavy mainly to attempt to break biennial bearing in the tree, and another grower may thin heavy to get size and color. Degree and method of thinning resolves itself down to the final market into which the crop will go, or the amount of time and labor that can be afforded by the grower.

THE SUMMER MEETING

Plans are being made for the annual summer field meeting. It will be held at Gardenhour Brothers' Orchard, Smithsburg. The date has been set for July 19, and the program is arranged to have growers see the soil erosion work, and possibly make a short tour to nearby orchards. Little or no speaking. Notice will be sent out as soon as plans are worked out.

THE 1938 PROCEEDINGS

After several unavoidable delays, the Proceedings of the Annual Meeting at Baltimore in January have been mailed to all *paid-up* members. If you have paid the 1938 membership but have not received the Proceedings, just drop a card to A. F. Vierheller, College Park, Maryland. If you have not paid, but received the proceedings, let your conscience guide you. The annual membership is one dollar.

CAN WE ASSIST YOU?

This organization lends money to sound fruit growers to finance the production of their crops—to pay cash for their purchases and save the discount. The interest rate is 5%, for the time the money is actually used. We serve growers in Virginia, West Virginia, Maryland, Pennsylvania and Delaware. Perhaps we can assist you.

East Central
Fruit Growers Production Credit Association
Hagerstown, Md.

COLD STORAGE HOLDINGS

The movement of apples out of storage in May, was the heaviest recorded, except for 1924, the movement totalling close to 4 million bushels. The figures follow:

Apples, *Barrels*—June 1, 1937, 3,000; May 1, 1938, 32,000; June 1, 1938, 12,000. *Western Boxes*—June 1, 1937, 899,000; May 1, 1938, 2,318,000; June 1, 1938, 796,000. *Bushels*—June 1, 1937, 479,000; May 1, 1938, 3,365,000; June 1, 1938, 1,133,000. Total Number Bushels—June 1, 1937, 1,387,000; May 1, 1938, 5,779,000. There were 42 million bushels more of *frozen fruits* in storage on June 1, 1938, than on June 1, 1937. These were mainly newly frozen strawberries, and old stocks of blueberries, cherries, peaches, and other fruits.

ADVERTISING

The New York Packer recently carried an article regarding the Thirtieth Anniversary of the California Fruit Growers' Exchange. Things got tough with orange growers back in 1908 with over 17,000 cars of oranges to move. The Exchange decided to try an advertising campaign in Iowa. It worked. In the past thirty years of advertising, the Exchange has told everybody about the healthful goodness of oranges and lemons. The per capita consumption of oranges has raised from 31 oranges per year to 79 oranges, and has increased the wholesale value of Exchange citrus fruits over 119 million dollars in the thirty year period. The Exchange spends at least a million dollars a year in advertising.

A new organization known as Georgia Association of Peach Growers has pledged a fund of not less than $25,000 to advertise Georgia "Beautirized" peaches in New York, Boston and Philadelphia, this year.

Appalachian Apples is about to begin the apple advertising sign-up for Virginia, West Virginia, Pennsylvania and Maryland for 1938. The past work of this organization should speak for itself. It was never claimed to be perfect. It is not supported by every grower, as it should be. It can scarcely be denied that the money spent has gotten where it belonged with a minimum of overhead.

There are two points not to be overlooked. First, Appalachian Apples has made a start toward apple advertising, and has also formed a contact among all of the apple advertising plans in the country. Second, it has shown what can be done with a little money, and what could be done with more money and closer supervision of the retail trade outlets.

The organization is composed of and controlled by fruit growers. They need funds to continue. They can't do a "Packard" job with a "wheelbarrow" income. Think it over, and be ready to subscribe whole-heartedly.

Summer Boarder—Those hogs are making an awful fuss outside my window.

Boy—I guess they're peeved. That was their room all winter.

Bum—"Could you give a poor fellow a bite?"
Lady—"I don't bite, myself, but I'll call the dog."

Have you read the advertisments?

NOW IS THE TIME

TO CONTROL LEAF HOPPER

D-X is the most efficient and economical material to use

Do not wait until leaf hoppers become winged adults. Kill the wingless nymphs and prevent egg laying. Examine the underside of the foliage periodically this month. When you find four or more leaf hopper nymphs per leaf, spray at once with D-X 1 pint to 100 gallons, either with your regular spray at that time or with a special spray with soap as a spreader. Of course D-X kills as many winged leaf hoppers as any other contact spray, but to wait is not modern scientific orchard practice for the elimination of this pest.

CITRUS SPRA - CREAM

IS THE SAFE ECONOMICAL SUMMER OIL EMULSION

Use Citrus Spra-Cream as your summer oil for the control of Codling Moth, Pear Psylla, Red Mite, etc. If you are not prepared to wash, use 3 quarts Spra-Cream, 1 pint D-X to 100 gallons of water. Time your spray in accordance with bait traps or orchard service recommendations. If you are prepared to wash, the most effective spray is the smash or dynamite spray with three or four quarts of Citrus Spra-Cream, 3 pounds Arsenate of Lead, 1 pint of D-X to the hundred. The Arsenate of Lead sticks tighter in this combination than any other combination you have ever used, yet it washes off readily in the commercial fruit washers. Write for special bulletins.

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